

# 高速压力比例阀 High Speed Proportional Regulator

## QKL- HS0、HS1、HS2



QKL-HS 系列是一款三通电子压力比例阀。它系由电磁阀、压力传感器、精细研磨的阀芯和及电子回路控制所组成。该系列具有流量大、压力切换时间极快、精度高、与氧气和氢气兼容的特点。使用我们自行开发的内部软件，可以自定义控制参数，允许用户建立独特的压力曲线，且它可用于仿真和数字命令信号。

QKL-HS1, QKL-HS2 are 3-way electronic pressure regulators. It consists of proportional solenoid, pressure transducer, intelligent electronics, and a refined spool. It features high flow rate, extremely fast pressure switching time, high accuracy, and compatible with oxygen and hydrogen gas. Using the powerful in-house software, the control parameter can be customized that allows user to build unique pressure profile. It is available with analogue and digital command signal.

### 型号选择 Ordering Code

QKL -  -  -  -

#### 系列 Type

|     |                   |                  |
|-----|-------------------|------------------|
| HS0 | 内部回授              | G 1/4"<br>G 3/8" |
|     | Internal Feedback |                  |
| HS1 | 内部回授              | PT 1/4"          |
|     | Internal Feedback |                  |
| HS2 | 内部回授              | PT 1/2"          |
|     | Internal Feedback |                  |

#### 输入讯号 Input Signal

|    |              |
|----|--------------|
| *E | 0 - 10 V     |
| A  | 4 - 20 mA    |
| R  | RS485 Modbus |
| IO | IO-Link      |

#### 本体材质 Body Material

|   |          |
|---|----------|
| A | Aluminum |
| B | Brass    |

#### 监控讯号 Monitor Output

|    |              |
|----|--------------|
| C  | 0 - 10 V     |
| A  | 4 - 20 mA    |
| R  | RS485 Modbus |
| IO | IO-Link      |

\*控制讯号选择 0-10V，请留意最小的驱动电流为 50mA。

For Command Signal type 0-10V, the minimum driving current is 50mA.

\*若电源线长度会超过 2 米长，控制讯号建议选择 4-20mA 电流控制或 RS485-Modbus 数字控制方式。

For cable length >2meter, please select current loop or RS485-modbus input signal.

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### 产品规格 Specifications

| 系列 Type                                                  | QKL-HS0                                                                                                                                                      |                            | QKL-HS1                             | QKL-HS2                                        |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------|------------------------------------------------|
| 阀门类型 Valve Type                                          | 3 □ 2 位直动式驱动 3/2 Directly actuated seating valve                                                                                                             |                            |                                     |                                                |
| 材料 Materials                                             | 本体黄铜或铝合金、轴心不锈钢<br>Body brass or Aluminum, Mandrel stainless steel                                                                                            |                            |                                     |                                                |
| 密封圈 Seals                                                | 氟橡胶 FKM                                                                                                                                                      |                            |                                     |                                                |
| 接液材质 Wetted Materials                                    | 铝合金、黄铜、不锈钢、氟橡胶(氧气相容)、全氟橡胶<br>Aluminum, Brass, Stainless steel, Viton(oxygen gas compatible), FFKM                                                            |                            |                                     |                                                |
| 固定架材质<br>Mounting Bracket Material                       | 镀锌钢板 Galvanized Steel                                                                                                                                        |                            |                                     |                                                |
| 口径 Port                                                  | G 1/4"                                                                                                                                                       | G3/8"                      | PT 1/4"                             | PT 1/2"                                        |
| 输出压力 Output Pressure(bar)                                | 0-10                                                                                                                                                         | *0~30/<br>0~50             | 0~2/0~5/0~10/0~20<br>0~30/0~35/0~50 | 0~2/0~5/0~10/0~20/0~30<br>0~35/0~50/0~70/0~100 |
| **建议最大入气压力(bar)<br>**Suggesting Supply Pressure Max(bar) | 输出压力的 1.2 倍<br>1.2 Times Output Pressure                                                                                                                     |                            |                                     |                                                |
| 工作电源 Power Supply                                        | DC24V ±10% (≤40W)                                                                                                                                            |                            |                                     |                                                |
| 输入讯号 Input Signal                                        | 0-10V / 4-20mA / RS485                                                                                                                                       |                            | 0-10V / 4-20mA / RS485 / IO-Link    |                                                |
| 监控信号 Monitor Output                                      | 0-10V / 4-20mA / RS485                                                                                                                                       |                            | 0-10V / 4-20mA / RS485 / IO-Link    |                                                |
| 流量 Flow Rate (ANR) NI/min                                | 1600<br>@10 bar                                                                                                                                              | 6000<br>@30 bar            | 4,800<br>@30 bar                    | 11,000<br>@30 bar                              |
| 介质 Medium                                                | 无害气体、一般空气、无油气体、无冷凝物气体、<br>氢气、氧气(通过绝热压缩测试)<br>Harmless gases, air, free of oil, condensate-free,<br>hydrogen gas, oxygen(adiabatic compressor test performed) |                            |                                     |                                                |
| 建议过滤器 Recommended Filter                                 | 50 μm                                                                                                                                                        |                            |                                     |                                                |
| 安装方向 Mounting Position                                   | 电磁铁不得朝下 Magnet must not face downwards                                                                                                                       |                            |                                     |                                                |
| 防护等级 IP Degree of protection                             | IP 54                                                                                                                                                        |                            |                                     |                                                |
| 重量 Weight                                                | 1 kg(本体铝合金)<br>(Body Aluminum)                                                                                                                               |                            | 1.2 kg(本体铝合金)<br>(Body Aluminum)    | 2 kg(本体铝合金)<br>(Body Aluminum)                 |
| 环境温度 Ambient Temperature                                 | 0 – 60 °C                                                                                                                                                    | 迟滞 Hysteresis              |                                     | < 0.1 % FS                                     |
| 介质温度 Temperature of medium                               | 0 – 60 °C                                                                                                                                                    | 最小移动量 Response Sensitivity |                                     | < 0.1 % FS                                     |
| 操作温度 Operating Temperature                               | 0 – 60 °C                                                                                                                                                    | 线性 Linearity               |                                     | < 0.1 % FS                                     |
| 温度飘移 Temperature Drift                                   | < 1 % / 10K                                                                                                                                                  | 重复性 Repeatability          |                                     | < 0.1 % FS                                     |
| 长期飘移 Long-term Drift                                     | < 1 % FS/年 Year                                                                                                                                              |                            |                                     |                                                |

\*如需订制特别压力范围，请洽询本公司 Please contact us for customized pressure range.

\*\*若入气源会大于建议最大入气压力，请与业务洽询，确认最合适的使用方式。If the supply pressure would higher than we suggested, please contact with our sales for the the most suitable operation.

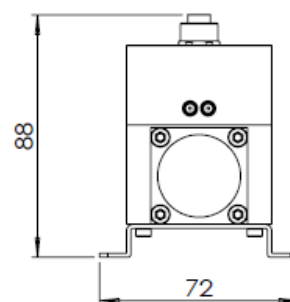
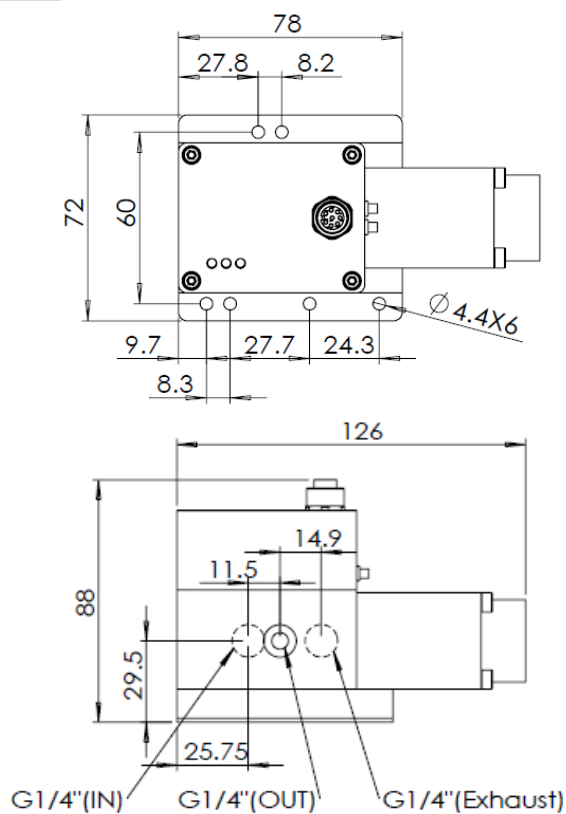
# 高速压力比例阀 High Speed Proportional Regulator



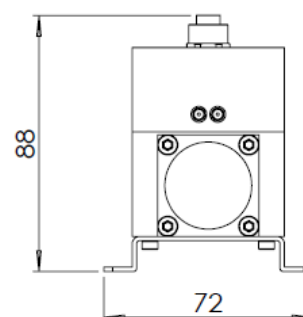
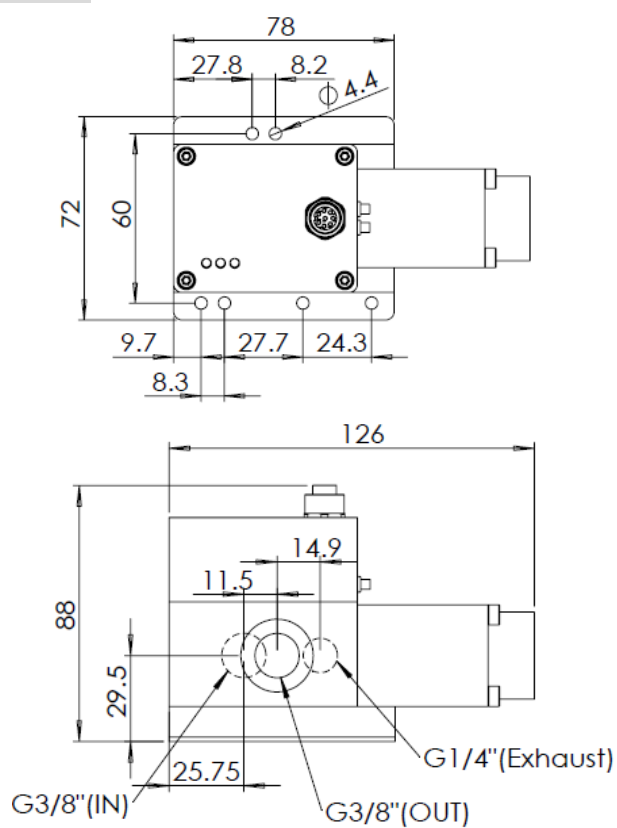
## QKL- HS0、HS1、HS2

### 外观尺寸 Overall Dimension

#### QKL-HS0(10bar)



#### QKL-HS0(30bar)



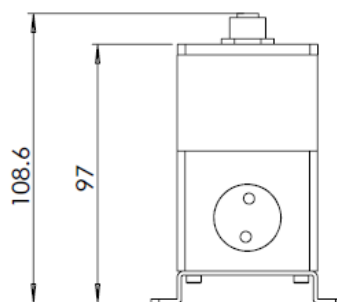
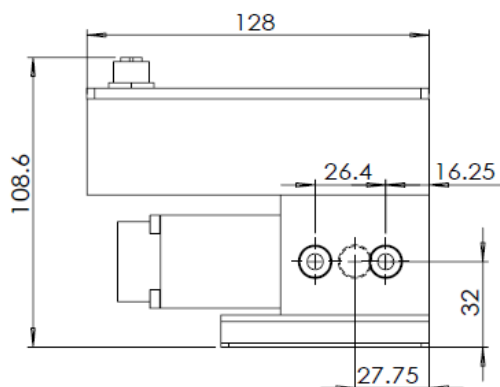
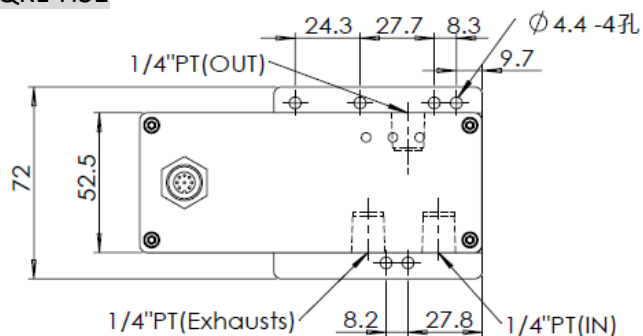
# 高速压力比例阀 High Speed Proportional Regulator



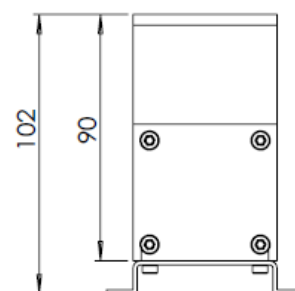
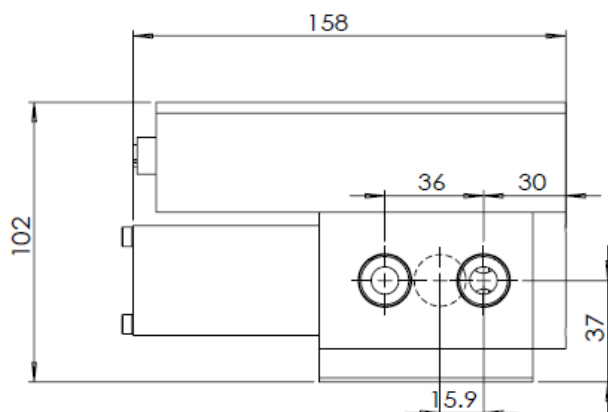
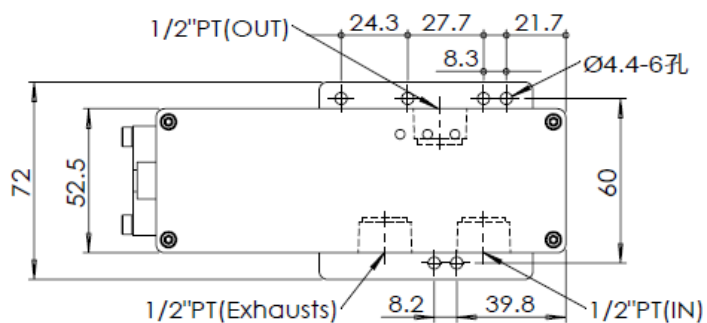
## QKL- HS0、HS1、HS2

### 外观尺寸 Overall Dimension

#### QKL-HS1



#### QKL-HS2



# 高速压力比例阀 High Speed Proportional Regulator

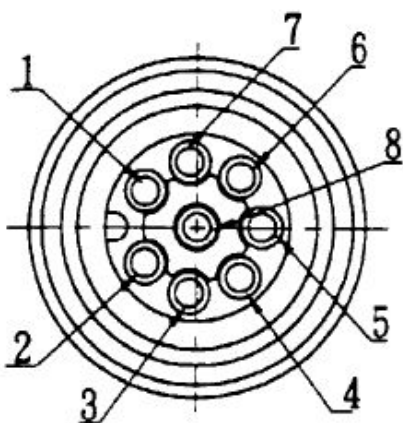
## QKL- HS0、HS1、HS2



### 指示灯状态 Indicator LED Status

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>电源供应灯 Power Supplying Light:</b><br>亮灯表示 DC24 电源正常供给。<br>LED on is power DC 24V normally supplied.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|  | <b>压力到点指示灯 Pressure Light:</b><br>亮灯表示输出压力到达设定值。<br>LED on means setting pressure reach the set value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  | <b>错误指示灯 Error Light :</b> <ol style="list-style-type: none"> <li>灯号慢闪烁(仅 HS1.HS2 有该功能)-供给电压超过 DC30V 或低于 DC20V<br/>                         LED flashing slowly(only available for QKL-HS1 and -HS2 series)<br/>                         -The supply voltage exceed DC30V or lower than DC20V.</li> <li>灯号快闪烁(仅 HS1.HS2 有该功能)-阀体温度超过 70°C<br/>                         LED flashing fast(only available for QKL-HS1 and -HS2 series)<br/>                         -The temperature of valve body is over 70°C.</li> <li>灯号持续亮灯-未供给入气压或入气压力供给不足。<br/>                         LED stays on - Air pressure inlet is not supplied or insufficient.</li> </ol> |

### 接线方式 Wiring Description



※此接线图为线材公座俯视图

The wiring diagram shows from top view.

| 编号 No. | 颜色 Color  | 功能 Function |                                           |
|--------|-----------|-------------|-------------------------------------------|
| 1      | 蓝色 Blue   | 电源(-)       | 24V DC Power (-)                          |
| 2      | 棕色 Brown  | 电源(+)       | 24V DC Power (+)                          |
| 3      | 黑色 Black  | 监控输出(+)     | Monitor output (+)                        |
| 4      | 白色 White  | 模拟讯号(+)     | 0-10 V Command (+)<br>4-20 mA Command (+) |
| 5      | 灰色 Gray   | 数字讯号        | RS485(D-)                                 |
| 7      | 紫色 purple | 模拟讯号(-)     | 0-10 V Command (-)<br>4-20 mA Command (-) |
|        |           | 监控输出(-)     | Monitor output (-)                        |
| 8      | 红色 Red    | 数字讯号        | RS485(D+)                                 |

若控制选择数字讯号(RS-485),则 QKL-HS1 及 QKL-HS2 可另外订制错误讯息输出(24V)功能。  
 HS1 and HS2 can be customised with error output signal(24V)

**警告:** 当安置完成信号线后,切勿旋转拉扯插头,以避免内部传感器受到损害,造成产品功能异常或故障。  
**Warning:** Do not rotate the connection socket when connected, to avoid damage to the internal sensor.

### 产品注意事项



#### 安装和操作产品前请仔细阅读操作手册

忽视操作手册中的安全说明会导致产品故障或给操作员带来严重风险。



#### 产品的连接、安装、操作、维护和拆卸只能由专业人员进行



#### 加压系统

1. 压力管路和螺纹连接必须针对阀门的输入压力和输出压力进行充分设计。
2. 在对系统加压之前，确保压力管线正确连接到输入和输出。
3. 关闭压力供应，释放残余压力，并在更换或维护阀门前拆下所有压力连接。



#### 爆炸危险

1. 请不要在有易燃气体、阀杆或灰尘的房间内操作阀门。
2. 请勿将调节阀用于易燃易爆气体的压力控制。



#### 阀门电子组件损坏风险，为避免损坏阀门，请遵守以下注意事项：

自出厂起一年以内为保固期限，请务必遵守使用注意事项，因人为因素造成的产品不良，本公司对本保修不承担任何责任。



#### 如进气压力大于额定压力 10bar，这有可能造内部传感器的永久破坏。请遵照标签上额定压力来操作比例阀

仅在技术规范中规定的允许压力范围内操作阀门。



#### 电子放电可能会损坏敏感的微电子组件

1. 如果没有足够的静电放电（ESD）保护，请勿触摸阀门的电气连接。
2. 在打开电子设备外壳之前，请遵循 ESD 保护说明。



#### EMC 互补操作必须满足以下条件：

1. 将屏幕连接、插头和设备柜连续接地。
2. 将阀体和外壳连接到保护接地导体（设备接地导体）。

## 高速压力比例阀 High Speed Proportional Regulator

### QKL- HS0、HS1、HS2



#### 有损坏阀门的风险

为避免损坏阀门，请遵守以下注意事项：

1. 在内置位置，阀门磁铁不得朝下。
2. 正确拧紧压力管路与阀门之间的连接，否则产生的碎屑可能会损坏阀门。
3. 注意强磁场，以免发生故障。
4. 确保压力供应系统至少配备50 μm 过滤器。
5. 含有冷凝物的流体可能会导致阀门故障。确保压力供应系统配备空气干燥器、后冷却器和油和水提取器。

#### 由于输入压力小于或等于给定设定值或阀门在没有输入压力的情况下操作，磁铁过度加热可能导致传感器系统精度下降和电子组件寿命缩短

1. 确保阀门的进气压力始终比设定值高至少1bar。
2. 先开启输入压力，再开启设定值。设定值变更时请勿打开和关闭输入压力。
3. 在关闭输入压力之前，请务必先归零设定值。

#### 注意

如果任何标签或序列号被更改、变得难以辨认或被移除，则保修无效。

#### 注意

请勿在控制信号线的旁边放置高压电线、伺服马达电缆或变频器。

#### 注意

技术数据如有更改，恕不另行通知。设计可能与实际产品不同。

### Product Precautions



#### **Read the operating manual carefully before installing and operating the product**

Ignoring the safety instructions in the operating manual may result in malfunction of the product or a serious risk for the operator.



#### **Connection, installation, operation, maintenance and dismantling of the product may only be carried out by qualified personnel**



#### **Pressurized systems**

1. Pressure lines and screw connections must be adequately designed for the input pressure and output pressure of the valve.
2. Ensure that the pressure lines are connected properly to the input and output, before pressurizing the system.
3. Turn off the pressure supply, release the residual pressure, and remove all pressure connections before replacing or maintenance of the valve.



#### **Danger of explosion**

1. Do not operate the valve in rooms with flammable gases, steams or dust.
2. Do not use the control valve for the pressure control of flammable or explosive gases.



#### **Risk of damage to the valve electronics**

To avoid damages to the valve, please comply with the following notes:

1. Overvoltage may damage the electronics. Before turning on the valve, check the electrical connections and the supplied voltages carefully. Pay attention to the specified supply voltage range.
2. Lay the wires of the communication system and I/O device separately from power lines and servo motor cables.
3. Make sure the cables are adequately insulated. Use only cables that are suitable for the power consumption and ambient conditions of the valve.
4. Avoid repeatedly bending or stretching the cables or damaging the valve's housing.



#### **Operating pressures greater than 10 bar of the stated pressure range may cause permanent damage to the sensor of the valve**

Operate the valve only in the permissible pressure range, as specified in the technical specifications.



#### **Electronic discharge may damage sensitive microelectronic components**

1. Do not touch the electrical connections of the valve without sufficient electrostatic discharge (ESD) protection.
2. Follow the ESD protection instructions before opening the housing of the electronics.



#### **The following conditions must be met for EMC compliant operation**

1. Connect the shield connection, the plug and the equipment cabinet to ground accordingly.
2. Connect the valve body and the housing to the protective earth conductor (equipment grounding conductor).



**Risk of damage to the valve**

To avoid damages to the valve please comply with the following notes:

1. In built-in position the valve magnet must not face downwards.
2. Tighten the connection between pressure lines and the valve correctly, otherwise resulting chips may damage the valve.
3. Pay attention to strong magnetic fields in order to avoid malfunctions.
4. Make sure that the pressure supply system is at least equipped with 50 µm filters.
5. Fluids containing condensate may cause malfunctions of the valve. Make sure that the pressure supply system is equipped with an air dryer, after cooler and an oil and water extractor.



**Excessive heating of the magnet, due to the input pressure being less than or equal to the given set value or if the valve is operated without input pressure, may cause a decreasing accuracy of the sensor system and a shortened lifetime of the electronic components**

1. Make sure that the valve is always pressurized with at least 1 bar more input pressure than the set value.
2. Switch on the input pressure first then enable the set value. Do not turn the input pressure on and off while the set value is activated.
3. Always switch off the set value before switching off the input pressure.



**NOTICE**

Warranty void if any label or serial number is changed, made illegible or removed.



**NOTICE**

Do not run control cables next to high-voltage lines, servo-motor cables, inverters...etc.



**NOTICE**

Technical data are subject to changes without further notice. Design may vary from the actual product.